

**AMENDMENTS TO THE CLAIMS**

Please amend the claims as follows.

1. (Original) A method for measuring high-energy radiation, comprising:  
    applying a voltage pulse to electrodes in an ion chamber filled with a gas capable of  
        forming charged ions by the high-energy radiation;  
    measuring an ion current signal related to ion currents induced by the voltage pulse; and  
    determining a magnitude of the high-energy radiation based on the ion current signal.
2. (Original) The method of claim 1, further comprising measuring a leakage current signal,  
    wherein the determining the magnitude of the high-energy radiation comprises subtracting  
    the leakage current signal from the ion current signal.
3. (Original) The method of claim 2, wherein the measuring the leakage current signal is  
    performed after the voltage pulse is turned off.
4. (Original) The method of claim 2, further comprising determining a gain.
5. (Original) The method of claim 4, wherein the determining the gain comprises applying a  
    ramping current to the electrodes in the ion chamber.
6. (Original) The method of claim 4, wherein the gain is used to adjust a magnitude of the ion  
    current signal or a magnitude of the leakage current signal.
7. (Original) The method of claim 6, wherein the subtracting the leakage current signal from  
    the ion current signal uses a magnitude-adjusted ion current signal or a magnitude-adjusted  
    leakage current signal.
8. (Original) The method of claim 1, further comprising determining a gain, wherein the  
    determining the magnitude of the high-energy radiation is based on the ion current signal and  
    the gain.
9. (Original) The method of claim 8, wherein the determining the gain comprises applying a  
    ramping current to the electrodes.
10. (Original) A system for measuring high-energy radiation, comprising:

an ion chamber having an ionizable material that can be ionized by the high-energy radiation;  
two electrodes disposed in the ion chamber; and  
a circuit connected to the two electrodes, wherein the circuit is configured to provide a voltage pulse to the two electrodes and to measure an electrical signal across the two electrodes.

11. (Original) The system of claim 10, wherein the ionizable material comprises one selected from helium-3, boron trifluoride, lithium-6, uranium-233, uranium-235, and plutonium-239.
12. (Original) The system of claim 10, further comprising a target chamber comprising a hydrogenous material, wherein the target chamber is disposed proximate the ion chamber, and wherein the high-energy radiation comprises neutron radiation.
13. (New) A method for measuring high-energy radiation using the system of claim 10.